REMARKS

Applicants respectfully request reconsideration and allowance of the present application based on the foregoing amendments and following remarks. By this amendment, claims 19, 26, and 30 have been amended. Upon entry of this amendment, claims 10, 15-19, 23-26, 30, 31 and 34 will remain pending in the application.

Claim Rejections under 35 USC § 112, first paragraph

Claims 10, 18, 19, 23-26, 30, 31 and 34 stand rejected under 35 USC 112, first paragraph as failing to comply with the written description requirement. For reasons set forth below, Applicants respectfully request that the rejections be withdrawn.

Claims 10, 18, 25 – "identifying a plurality of grid points" and "determining an average height"

The Office Action notes that these claims recite "identifying a plurality of grid points located a predetermined distance from the reference location," and "determining an average height of the receiver based on elevation information associated with the plurality of grid points." The Office Action asserts that these limitations are not supported by the original disclosure and thus are new matter.

Applicants respectfully disagree with the basis for the rejections.

In one example description of this claimed subject matter, the specification teaches an example of identifying a reference location, a plurality of grid points a predetermined distance from the reference location and determining an average height based on elevation information associated with the grid points at paragraph 79 as follows:

> In FIG. 5, a flow chart 500 of the steps for determining location with a SATPS receiver with digital terrain elevation data is shown. The SATPS receiver 102 starts 502 by receiving three SATPS satellite spread spectrum signal 116, 118 and 120 and digital terrain elevation data from digital terrain elevation data memory 262 in server 250. Upon a reference location being determined, the orthometric heights at points 1 km apart in the easting and northing direction are retrieved with the reference location at the center 504. A total of $(2xN+1)^2$ points are considered on a grid of (2xN+1)x(2xN+1) points. The orthometric "H"

coordinates are converted to WGS 84 "h". The average "h" is determined and the "h" error equal to absolute value of the difference between the average "h" and the maximum or minimum "h" (whichever is the greater).

Those skilled in the art will further understand from the above disclosures that the "predetermined distance" of the grid points refers to the notion that in some embodiments of the invention, the points are separated by a same distance (e.g. 1km) from each other, and thus from the reference location. Moreover, as can be seen from the example above, the elevation information at the grid points includes the database information at the grid points, such as the orthometric "H" coordinates. From these orthometric heights, the average height "h" is determined.

Accordingly, it is respectfully submitted that the claimed subject matter is fully supported by the specification as originally filed and that the § 112 (first paragraph) rejections of the claims should be withdrawn.

In the "Response to Arguments" section, the Office Action states that "the height applicant is referring to in the specification is different from that claimed." (Action at 11.) Applicants respectfully note that they have invented the claimed subject matter and have submitted the written descriptions thereof, not the Examiner. Applicants have attempted to assist the Examiner by identifying descriptions in their disclosure that they have provided and which correspond to the claimed subject matter. To the extent the Examiner is taking the position that the words in the claims and certain descriptions in the specification are not ipsis verbis the same, Applicants respectfully submit that this is blatantly incorrect, as conclusively demonstrated in connection with the written descriptions provided above, and in any event is not the proper standard for a rejection under Section 112. Applicants have identified where written descriptions of the claimed subject matter are found in the specification, and so has adequately demonstrated why the above bases for the rejection are in error and should be withdrawn.

Claims 10, 18, 25 – "determining an average height error value"

The Office Action notes that these claims recite "determining an average height error value based on the elevation information associated with the plurality of grid points and the

average height of the receiver." The Office Action asserts that these limitations are not supported by the original disclosure and thus are new matter.

More particularly, the Office Action states that paragraph 024 of the specification calls for an error in the fixed height h, but not an average error value. However, Applicants respectfully submit that the specification as filed fully supports the language used in the claims.

For example, as shown above, paragraph 79 of the specification teaches:

> In FIG. 5, a flow chart 500 of the steps for determining location with a SATPS receiver with digital terrain elevation data is shown. The SATPS receiver 102 starts 502 by receiving three SATPS satellite spread spectrum signal 116, 118 and 120 and digital terrain elevation data from digital terrain elevation data memory 262 in server 250. Upon a reference location being determined, the orthometric heights at points 1 km apart in the easting and northing direction are retrieved with the reference location at the center 504. A total of $(2xN+1)^2$ points are considered on a grid of (2xN+1)x(2xN+1) points. The orthometric "H" coordinates are converted to WGS 84 "h". The average "h" is determined and the "h" error equal to absolute value of the difference between the average "h" and the maximum or minimum "h" (whichever is the greater).

Those skilled in the art will understand from the above disclosures teach one example of an "average error value" that is equal to an absolute value of the difference between the average height "h" and the minimum or maximum height of the SATPS receiver as reflected in the elevation information associated with the grid points (i.e. the minimum or maximum height at the grid points). So contrary to the Office Action, the specification does not limit the invention to computing an error in a "fixed height" of the receiver.

Accordingly, it is respectfully submitted that the claimed subject matter is fully supported by the specification as originally filed and that the § 112 (first paragraph) rejections of the claims should be withdrawn.

In the "Response to Arguments" section, the Office Action states that "Applicants' disclosure section 024 calls for a 'fixed height h'. . . . NOT – average height error value – as claimed." (Action at 11.) Applicants again respectfully note that they have invented the claimed subject matter and have submitted the written descriptions thereof, not the Examiner. Applicants have attempted to assist the Examiner by identifying descriptions in paragraph 079 of their

disclosure that correspond to the claimed subject matter, in addition to paragraph 024 cited in the Office Action. To the extent the Examiner is taking the position that some descriptions in section 024 of Applicants' disclosure are not ipsis verbis the same as what is in the claims or section 079 of Applicants' disclosure, Applicants respectfully submit that such a position is factually incorrect, and in any event is not the proper standard for a rejection under Section 112.

In any event, to avoid confusion and from words in the disclosure being taken out of context or misunderstood as done in the Office Action, section 024 more fully states that :

> To select the appropriate terrain from the digital terrain elevation data in the digital terrain elevation data memory 262 located in server 250, the SATPS spread spectrum signal 116, 118 and 120 from the three satellite 106,108 and 110 are solved first for a fixed height "h". The **fixed value of "h"** may be initially assigned to the **average value of "h"** in the neighborhood of the base station (unlike known approaches of using the previous values of "h"). Error in the fixed "h" is the absolute value of the difference between the average and the minimum or maximum value of "h". With this information, the three SATPS satellite position solution with fixed "h" comes with an estimated error ellipse."

Those skilled in the art will understand that this passage describes an example implementation where the "fixed value of 'h'" is initially assigned to an average of "h" in a surrounding area. An error in this initial value can then be computed. Thus, the "fixed value of h" in this example is the same as the "average value of h." Moreover, the error in "fixed value of 'h'" is initially determined from "difference between the average and the minimum maximum value of 'h'" . Accordingly, those skilled in the art will understand that initially, the error in the fixed value of "h" is the same as the claimed average error value, and so the specification fully supports, and is consistent with, the claims.

For the Examiner's further assistance, Applicants note that paragraphs 024 and 079 of the specification provide two descriptions of example embodiments of the claimed invention. The description at paragraph 024 is in connection with structural embodiments according to the invention shown in FIGs. 1 and 2, and the description at paragraph 079 is in connection with a flowchart according to the invention illustrated in FIG. 5. Those skilled in the art will these

separately located written descriptions relate to the same invention and are not inconsistent with each other or the claims.

For at least the above reasons, the § 112 (first paragraph) rejections are submitted to be in error and Applicants request that they be withdrawn.

Claim Rejections under 35 USC § 112, second paragraph

Claims 10, 15-19, 23-26, 30, 31 and 34 stand rejected under 35 USC 112, second paragraph as being indefinite. For reasons set forth below, Applicants respectfully request that the rejections of the claims are in error and should be withdrawn.

Claims 19 and 26

The Office Action states that it is not clear what is set forth in the claim limitations "a maximum height of a satellite position receiver" or "a minimum height of a satellite position receiver." Although Applicants respectfully disagree with these bases for this rejection, claims 19 and 26 have been amended to even more clearly specify that the minimum height and the maximum height are identified from among the elevation information respectively associated with the plurality of grid points .

Accordingly, it is respectfully submitted that the amended claims are even more clear in view of the specification.

Claims 10, 18, 25, 34

The Office Action states that it is not clear what is set forth in the claim limitations "average height," and "average height error." More particularly, the Office Action states that "it not [sic] clear what height applicant is referring to. What 'average height error value' is applicant referring to? Is it the height of a satellite from the earth, the height of a mountain?" Applicants respectfully disagree and submit that the claims are clear to those skilled in the art in view of the claims as a whole and the specification.

First, in all instances where the term "height" is used, the claims clearly recite that the "height" is "of the satellite positioning receiver." So there is no basis for the Office Action's statement that one skilled in the art could wonder whether the claimed height was of "a satellite from the earth" or "a mountain." Clearly, the claimed height refers to the height of the satellite positioning receiver.

Second, the claimed "average height error value" is clearly an "error value" associated with the claimed "average height" because the claims further require that this "error value" is determined based on the "average height." This claimed subject matter is abundantly clear to those skilled in the art from the specification as a whole, including paragraph 079 as set forth above.

Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claims 18, 19, 23

The Office Action states that these claims include a means plus function limitation, but that "Applicant does not identify the claimed means." Applicants respectfully disagree with the basis for this rejection.

First, the Patent Laws do not require Applicants to "identify the claimed means." Rather, 35 U.S.C. § 112 (sixth paragraph) permits Applicants to recite an invention in this manner, and such claimed means are directed to the structures disclosed in the specification and their equivalents. Accordingly, reference must be made to structures described in the specification, and not to any specific identification made by Applicants in any ancillary documents. For the Examiner's assistance, the structures associated with the claimed means are described in the specification at, for example, paragraphs 014 to 029. Accordingly, it is believed that this basis for the § 112 rejection of the claims should be withdrawn.

Claim Rejections under 35 USC § 102

Claims 10, 15-19, 23-26, 30 and 31 stand rejected under 35 U.S.C. 102(b) as being anticipated by Ptasinski et al., Journal of Navigation, 2002, chapter 55, pp. 451-462 ("Ptasinski"). Applicants respectfully traverse the rejections for reasons set forth more fully below.

Independent claim 10 recites (with similar subject matter in independent claims 18 and 25), inter alia:

> identifying a plurality of grid points located a predetermined distance from the reference location;
> determining an average height of the receiver based on elevation information associated with the plurality of grid points;
> determining an average height error value based on the elevation information associated with the plurality of grid points and the average height of the receiver;
> deriving at least three simultaneous equations associated with the at least three positioning signals;
> solving the at least three simultaneous equations with the average height of the receiver and the average height error value that results in a position and a corresponding horizontal error ellipse;
> fitting a two-dimensional polynomial to the corresponding horizontal error ellipse; and
> solving the at least three simultaneous equations and the two-dimensional polynomial that results in an altitude of the satellite positioning receiver.
> (emphasis added)

Applicants restate and incorporate herein the previous remarks against this rejection. To the extent possible, Applicants' remarks below will focus on new issues raised in the current Office Action.

Ptasinski merely teaches that WGS-84 uses an ellipsoidal model of the Earth, which is used in GPS positioning, and introduces equations and a methodology for estimating a position based on pseudoranges and altitude data from a digital map data-set.

However, nowhere does Ptasinski teach or suggest identifying a plurality of grid points located a predetermined distance from a reference point and determining an average height and average height error using elevation information associated with the grid points as required by independent claim 10.

Based on these facts, Applicants' previous responses have convincingly demonstrated that Ptasinski did not teach the subject matter as clearly set forth in the claims, specifically the subject matter set forth above.

The Office Action mainly responds that these limitations are not supported by the original disclosure, and apparently cannot be relied upon as distinguishing features. However, as

Applicants have shown above in connection with the § 112 rejections of the claims, these limitations are clearly supported by the original disclosure.

The Response to Arguments further states that "Ptasinski (figs. 5-10) mentions a digital map, well known to show a grid of grid of points [sic] (since digital is made of grids)." (Action at 12.) Applicants respectfully submit that this is insufficient support for a rejection under § 102. Just because Ptasinski mentions a map does not mean that Ptasinski teaches identifying a plurality of grid points located a predetermined distance from the reference location and then determining an average height of the receiver based on elevation information associated with the plurality of grid points, much less determining an average height error value based on the elevation information associated with the plurality of grid points and the average height of the receiver as clearly required by the independent claims.

Simply put, those skilled in the art would not be taught how to identify a plurality of grid points located a predetermined distance from a reference location and determine an average height and average height error using elevation information associated with the grid points based on Ptasinski's disclosure of a "digital map" of location information.

The Office Action further states that Hancock discloses a polynomial fit over a grid of points. (Action at 12.) However, only Ptasinski is relied upon for the § 102 rejection, not Hancock.

The Office Action still further states at page 12 that the "drawings [of Ptasinski] speak for themselves." Applicants respectfully note that Figures 1 and 2 of Ptasinski only show how errors can arise if a point located on an ellipsoid is calculated using an ellipsoid methodology or a spherical methodology. Figures 1 and 2 teach nothing to those skilled in the art about determining an average height of a receiver based on elevation information associated with a plurality of grid points identified around a reference point, much less determining an average height error value based on the elevation information associated with the plurality of grid points and the average height of the receiver as clearly required by the independent claims.

Finally, the Response to Arguments section states that "Applicant is not addressing all the sections cited by the Examiner in the prior art." This is incorrect. Applicants have repeatedly and convincingly addressed the teachings of Figs. 1 and 2 and pp. 452-454, which are all the sections relied upon by the Office Action. To summarize, those skilled in the art will understand

that these Figures and passages merely illustrate the difference between using a spherical and ellipsoid model, and how to use information based on both to determine an altitude. They do not teach or suggest anything about determining an average height of a receiver based on elevation information associated with a plurality of grid points identified around a reference point, much less determining an average height error value based on the elevation information associated with the plurality of grid points and the average height of the receiver as clearly required by the independent claims.

Independent claims 18 and 25 recite limitations similar to those in independent claim 10. Accordingly, Applicants respectfully submit that independent claims 18 and 25 distinguish over Ptasinski for reasons similar to those set forth above with respect to independent claim 10.

Claims 15-17 depend from independent claim 10. Claims 19, 23-24 depend from independent claim 18. Claims 26, 30 and 31 depend from independent claim 25. Accordingly, Applicants respectfully submit that the rejected claims distinguish over Ptasinski for at least the reasons set forth above, and so the rejections should be withdrawn.

Claim Rejections under 35 USC § 103

Claim 34 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Ptasinski et al., Journal of Navigation, 2002, chapter 55, pp. 451-462 ("Ptasinski") in view of U.S. Patent No. 6,202,023 to Hancock ("Hancock"). Applicants respectfully traverse this rejection for reasons set forth below.

Applicants restate and incorporate herein by reference their previous remarks regarding this rejection. To the extent possible, the following remarks will focus on new points raised in the current Office Action.

Independent claim 34 recites, inter alia:

> a horizontal error ellipse parameter in an altitude equation that forms an error ellipse having a major axis and a minor axis that corresponds to an altitude error about the initial height of the receiver;
>
> a plurality of points along the major axis and the minor axis that form a grid of grid points that the controller accesses the digital terrain elevation data in memory at the grid points; and
>
> a two-dimensional polynomial surface fit over the grid points.

The Office Action relies on Ptasinski for disclosing the claimed subject matter that is underscored above. Hancock is only relied upon for the claimed polynomial surface fit.

Applicants respectfully submit that Ptasinski, even if one skilled in the art would combine it with Hancock as alleged, does not disclose or suggest the invention as a whole as set forth clearly in the claims. In particular, the Office Action does not set forth a prima facie case of obviousness, at least because all claim limitations are not taught or suggested by the alleged combination of Ptasinski and Hancock.

As set forth above, Ptasinski merely teaches that location errors can be introduced when spherical approximations are used together with the ellipsoid model, for example in altitude aiding applications where a pseudosatellite is located at the center of the Earth. Ptasinski then introduces equations and a methodology for estimating a position based on pseudoranges and altitude data from a digital map data-set that allegedly overcome these approximation errors.

However, nowhere does Ptasinski teach or suggest the invention having the claim limitations that are explicitly set forth in independent claim 34.

As convincingly demonstrated in Applicants' previous responses, independent claim 34 clearly requires forming an error ellipse having a major and minor axis that corresponds to an altitude error about the initial height of the receiver. Just because Ptasinki notes that an ellipsoid model of the Earth is used by WGS-84 does not mean it teaches or suggests forming such an error ellipse. Ptasinksi does use the words "ellipsoid" and "error". However, Ptasinksi does not combine these words into a teaching of an invention of forming an error ellipse having a major and minor axis that corresponds to an altitude error about the initial height of the receiver. Those skilled in the art would not confuse an ellipsoid model of the Earth, as described in Ptasinski, to an error ellipse having a major axis and a minor axis that corresponds to an altitude error about the initial height of the receiver as required by the clear limitations of the claims. Nor would the skilled artisan be led to determine such an ellipse merely because Ptasinski also discloses errors in altitude estimation using spherical-based altitude aiding data.

With regard to these clear claim limitations, the Response to Arguments states that these facts demonstrating that Ptasinski's ellipsoid is not the same as the claimed error ellipse are "not convincing" because "applicant does not provide a definition of 'error ellipse' as claimed."

(Action at 12.) The Response further states that "the MPEP recognizes that the subject matter of the claims need not be described literally . . . in order for prior art to anticipate the claims." (Id.) This position ignores that the claims themselves define the claimed error ellipse as an ellipse "having a major axis and a minor axis that corresponds to an altitude error about the initial height of the receiver." Applicants arguments have convincingly demonstrated that the claims have limitations that are not taught or suggested by the prior art. It is therefore irrelevant whether certain isolated words in the claims such as "ellipse" are also found in the cited prior art as broadly construed. Rather, the test of obviousness is whether the invention as a whole and meeting all claim limitations is taught or suggested by the prior art .

As further demonstrated by Applicants' previous responses, independent claim 34 clearly requires a plurality of points along the major axis and the minor axis that form a grid of grid points that the controller accesses the digital terrain elevation data in memory at the grid points. Ptasinski discloses altitude aiding data, but it does not teach or suggest accessing data from memory at grid points as clearly required by independent claim 34. The Office Action points to Figures 1 and 2 of Ptasinski, which show ellipses and points. However, one skilled in the art would not be taught anything from these Figures about how to access data in a memory using these points, much less a plurality of points along the major axis and the minor axis [of an error ellipse] that form a grid of grid points that the controller accesses the digital terrain elevation data in memory at the grid points.

In the Response to Arguments, the Examiner states that the claimed plurality of points that correspond to an altitude error "is not claimed" as a particular limitation. (Action at 12.) Applicants respectfully submit that the Examiner is again focusing on words in isolation and ignoring the invention as a whole as required by all the claim limitations and antecedent basis within the claims. The claims require a plurality of points along the major axis and the minor axis that form a grid of grid points. The major and minor axes on which the points lie are axes of the claimed error ellipse, which is further required by the claims to correspond to an altitude error about the initial height of the receiver. Accordingly, contrary to the Response to Arguments, the claims clearly require that the claimed plurality of points along the major and minor axes correspond to an altitude error about the initial height of the receiver.

The Response to Arguments further states that "the points on the ellipse (in Fig. 1) form an error ellipse since they are approximations compared to spherical earth." (Action at 13.) This position yet again ignores the clear limitations of the claims, which require the claimed error ellipse as "having a major axis and a minor axis that corresponds to an altitude error about the initial height of the receiver." Just because Fig. 1 shows an ellipse and because Ptasinski further teaches errors between approaches in locations using spheres and ellipses does not mean that Ptasinski clearly teaches to those skilled in the art how to form an error ellipse "having a major axis and a minor axis that corresponds to an altitude error about the initial height of the receiver" as clearly required by the claims. The notion that claims can be interpreted broadly during examination does not mean that entire claim limitations can be removed and the invention as a whole completely glossed over . The test of obviousness is whether Ptasinski and/or Hancock teaches or suggests and error ellipse having a major axis and a minor axis that corresponds to an altitude error about the initial height of the receiver and a plurality of points along the major axis and the minor axis that form a grid of grid points that the controller accesses the digital terrain elevation data in memory at the grid points. It is not sufficient for the Office Action to pick and choose claim words in isolation and match them up with words and drawings in the cited prior art, and then form an overall theory why these words can be strung together in complete sentences that appear similar to the claims.

Finally, the Response to Arguments refers to Hancock as "clearly" showing a "grid of grid points" in Fig. 1 and cols. 4 and 6. (Action at 13.) Indeed, Hancock appears to show a grid placed relative to a reference point. However, it is not enough for Hancock to show a grid of points. What the claims require, and which Hancock utterly fails to teach or suggest is a plurality of points along the major axis and the minor axis [of an error ellipse corresponding to an altitude error] that form a grid of grid points that the controller accesses the digital terrain elevation data in memory at the grid points. So just because Ptasinski shows an ellipse and Hancock shows a grid does not mean that those skilled in the art would be taught by this alleged combination how to construct an error ellipse and grid points according to the invention as a whole and meeting all claim limitations.

For at least these reasons, therefore, Applicants respectfully submit that independent claim 34 patentably distinguishes over Ptasinski in combination with Hancock.

Conclusion

All objections and rejections having been addressed, it is believed that the claims are in condition for allowance, and Notice to that effect is earnestly solicited. If any issues remain which the Examiner feels may be resolved through a telephone interview, s/he is kindly requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,
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Date: June 18, 2010

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